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DESCRIPTION OF A NEW GENUS AND SPECIES OF MONACANTHID FISH FROM INDIA

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ABSTRACT

A new genus and species of monacanthid fish, *Lalmohania velutina*, is described from six specimens collected in the Kilakkarai region of south-eastern India. The taxon appears to be most similar to members of the genus *Stephanolepis*, but differs in scale structures, fin shapes, fin ray counts, lateral line sensory system, and structure of the pelvic fin rudiment.

INTRODUCTION

Hutchins (1988) investigated the morphology and phylogeny of the monacanthid fishes, following the cladistic approach of Hennig. Collections from many parts of the world were examined, resulting in the discovery of several new taxa. One of these is known from only six specimens collected in a small area of south-eastern India. This paper presents a description of this new form, and examines its relationships with other members of the family.

Methods of counting and measuring follow those of Hutchins (1977, 1986). Abbreviations for institutions are recorded in the Acknowledgements.

SYSTEMATICS

Family Monacanthidae Nardo, 1844

Genus *Lalmohania* gen. nov.

Type species

Lalmohania velutina sp. nov. (see below).

Diagnosis

Distinguished from all other Group A genera (i.e., those possessing a pelvic fin rudiment movably articulated with the pelvis, see Table 1) of Hutchins (1988) by its unique scale structures. All scales on the anterior one-quarter of the body, not including the head, are very small, each possessing several posteriorly curved spinules (up to five) arranged in a transverse line, whereas the scales on the posterior three-quarters are much larger, particularly those midlaterally, each supporting a single, elongate spinule (Figure 1); spinules of the male are more robust, bristlelike, extremities curving anteriorly, but not forming a prominent midlateral

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Table 1 Monacanthid genera belonging to Group A (Hutchins 1988)

Acreichthys Fraser-Brunner, 1941
Arotrolepis Fraser-Brunner, 1941
Chaetodermis Swainson, 1939
Colurodontis Hutchins, 1977
Laputa Whitley, 1930
Leprogaster Fraser-Brunner, 1941
Monacanthus Oken, 1817
Paramonacanthus Bleeker, 1865
Pervagor Whitley, 1930
Stephanolepis Gill, 1861
"Genus a" (described herein)
"Genus b" (genus and species are undescribed)

patch of bristles. Other distinctive characters include a moderately deep body with interdorsal space prominently concave in lateral profile, moderately large pelvic fin rudiment with a prominent space ventrally between the encasing scales, anterior portion of soft dorsal fin elevated in the male (but without filamentous rays), soft dorsal and anal fin ray counts low (25–27 and 25–28 respectively), pectoral fin ray counts low (10–11), caudal fin of male with an arrowhead-like shape to the rear margin, and 19 (7+12) vertebrae.

Relationships

In overall appearance, the genus is most similar to *Stephanolepis*, both taxa being relatively deep bodied with small ventral flaps. The lateral profiles of their interdorsal spaces and snouts are mostly concave (snout of male *Stephanolepis* is usually straight to slightly concave), and the anterior portion of the soft dorsal fins are somewhat elevated. In both *Lalmohania* and *Stephanolepis*, the caudal peduncles are not deep, and the pelvic fin rudiments are not large. Internally, both genera possess very similar skeletal structures, particularly in the skull and the pelvis. However, none of these similarities is considered to be synapomorphic (Hutchins 1988). The two genera differ noticeably in squamation, fin shapes, fin ray counts, lateral line sensory system, and structure of the pelvic fin rudiment. *Stephanolepis* is characterised by its distinctive lozenge-shaped cluster of spinules on a single, broad-based pedicle (spinule cluster is more circular and mushroom-shaped in small examples) on each body scale. Scales on the middle portion of the caudal peduncle of the male each possess an elongate spinule, distal extremity curving anteriorly in mature individuals, forming a well defined elongate patch of bristles extending a short distance anteriorly along the side of the body. In contrast, *Lalmohania* has no body scales with spinule clusters, and all scales on the posterior three-quarters of the body have single spinules which do not form a distinct bristle patch. The male of *Stephanolepis* has an elongate filamentous ray anteriorly in the soft dorsal fin (absent in *Lalmohania*) and has a rounded posterior margin to the caudal fin (more arrowhead-shaped in *Lalmohania*). Most members of *Stephanolepis* usually possess soft dorsal and anal fin ray counts of 30 or more, and pectoral fin ray counts of 12–14 (the exception is *S. setifer* from the Atlantic Ocean which has counts of, respectively, 26–30 and 11–13). In contrast, *Lalmohania* has much lower counts (soft dorsal 25–27, anal 25–28, and pectoral 10–11). *Stephanolepis* has the most primitive lateral line system of the family, especially in the retention of mandibular pores. Like all other monacanthids, however, *Lalmohania* has no mandibular

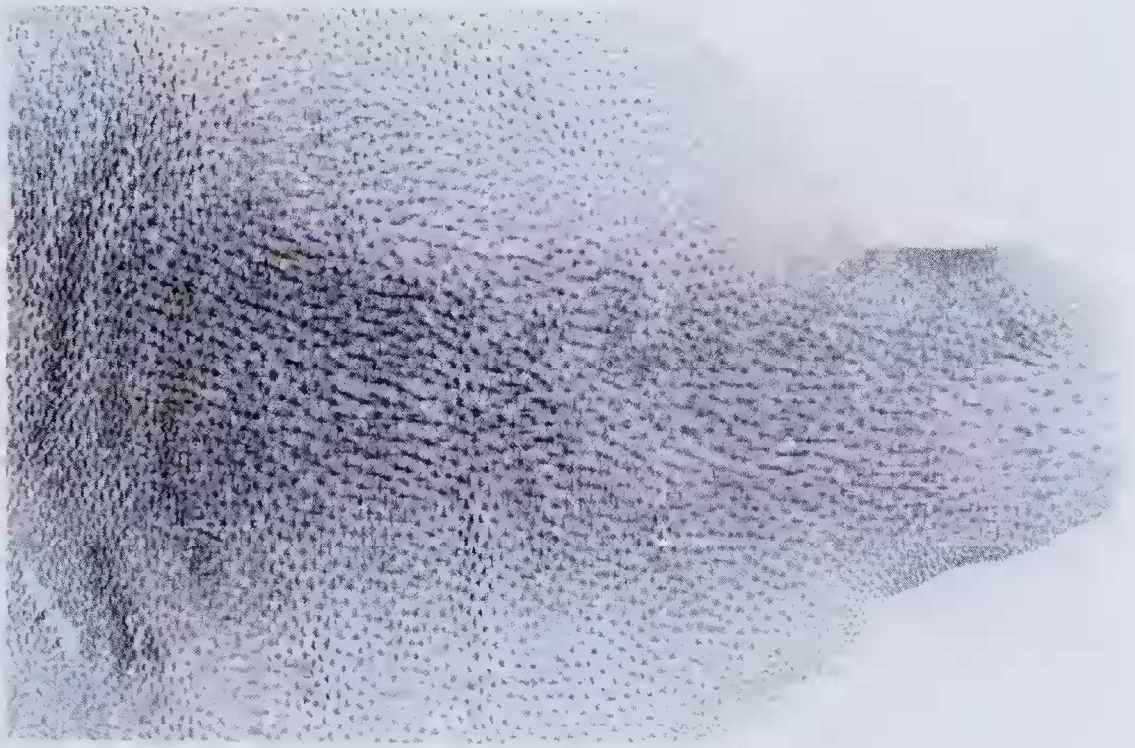

Figure 1 Cleared and stained skin (left hand side) of *Lalmohania velutina*, paratype, WAM P.30671–001, 55 mm SL, showing body scales in region posterior to pectoral fin.

pores. The pelvic fin rudiment of *Stephanolepis* lacks a prominent space between segments 2 and 3 (a small one is sometimes present), a feature which always occurs in *Lalmohania*. In addition, the rudiment is broadly joined dorsally to the ventral flap in *Stephanolepis*, but only very narrowly attached in *Lalmohania*.

This new form is similar in appearance to several other deep-bodied monacanthid genera but can be easily distinguished on several features. *Lalmohania* lacks the greatly enlarged ventral flap that characterises *Monacanthus* and *Leprogaster*. It differs from *Acreichthys* and *Chaetodermis* in having only 19 vertebrae (latter both have 20), from *Colurodontis* in having four predorsal neural spines, a robust pelvis, and pointed teeth (latter possesses three predorsal neural spines, a very slender pelvis, and truncate teeth), and from *Arotrolepis* by lacking both a dorsal ridge on the midline of the male's snout and a unique ventral expansion of the basioccipital for swim bladder support.

Etymology

This new taxon is named after R.S. Lal Mohan, Central Marine Fisheries Institute (CMFRI), Mandapam Camp. Not only was he involved in the collection of the type series, but he also provided invaluable assistance to me and other foreign participants during the FAO/DANIDA consultation at Cochin in 1980.

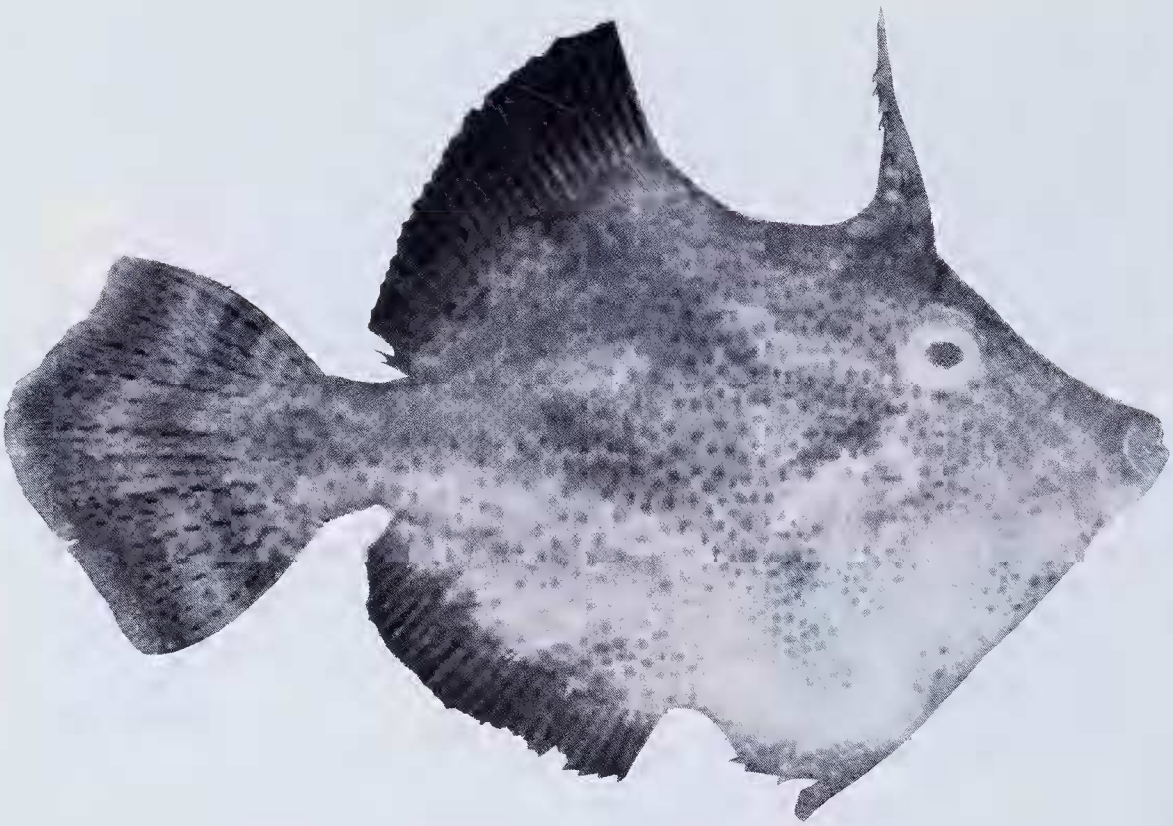

Figure 2 *Lalmohania velutina*, holotype, BPBM 20617, 72 mm SL (hyaline soft dorsal and anal fins appear black as specimen originally photographed on dark background).

Lalmohania velutina sp. nov.

Figures 1, 2 and 3; Tables 1 and 2

Stephanolepis diaspros (*non* Fraser-Brunner?) Munro, 1955: 275.

"Genus a species 1" Hutchins, 1988.

Holotype

BPBM 20617, 72 mm SL, male, Kilakkarai (approximately 9°16'N, 78°48'E), Gulf of Mannar, India, purchased from market, J.E. Randall, K. Rama Rao, and R.S. Lal Mohan, 4 March 1975.

Paratypes

BPBM 35756, 2 specimens, 62–73 mm SL, collected with holotype; WAM P.30671-001, 55 mm SL, collected with holotype, cleared and stained; CMFRI uncatalogued, 2 specimens, 68–83 mm SL, Kilakkarai, trawl net at 5 m, 12 December 1979.

Diagnosis

See generic account above.

Description

Measurements and counts of the holotype and paratypes are presented in Table 2. The

following counts and proportions in parentheses represent the ranges for the paratypes when they differ from those of the holotype.

Soft dorsal rays 26 (25–27); anal rays 26 (25–28), normally equal to or one more than soft dorsal count; pectoral rays 11 (10–11), although left hand side count of 7 considered a deformity; vertebrae 7+12=19 (one paratype with 7+13=20) (from radiographs and cleared and stained material); branchiostegals 1+4=5.

Body compressed but deep, width 2.2 (1.9–2.3) in head length and depth 1.5 (1.5–1.6) in SL; lateral profile of interdorsal space very concave, rising noticeably to origin of soft dorsal fin (Figure 2); head relatively short, length 3.0 (2.8–3.2) in SL; lateral profile of snout prominently concave, length 4.0 (4.1–4.3) in SL; eye diameter 3.4 (3.0–3.6) in head length, 1.0 (0.9–1.2) in interorbital width; gill opening a short slit, length 5.2 (4.0–4.9) in head length, positioned in advance of pectoral fin base, centred below posterior one-quarter of eye; pelvic flap small in size.

Mouth small, terminal, lips somewhat fleshy; dentition consisting of three outer and two inner teeth on each side of upper jaw (exposed portion of first inner tooth small but obvious, with rounded extremity, second inner tooth mostly covered by outer teeth); three teeth on each

Table 2 Measurements and counts of the holotype and paratypes of *Lalmohania velutina*.

	Holotype	Paratypes				
	BPBM 20617	CMFRI Uncat.	BPBM 35756	CMFRI Uncat.	BPBM 35756	WAM P30671–001
Standard length	72	83	73	68	62	55
Head length	24	26	24	23	21	20
Body depth	47	56	50	45	38	36
Body width	11	13	12	12	10	8.7
Snout length	18	20	17	16	15	13
Eye diameter	7	7.6	7.1	6.4	7.1	6.3
Interorbital width	7	8.4	7.4	7.8	6.8	5.7
Gill slit length	4.6	6.2	4.9	4.8	5.3	4.5
Snout to dorsal spine	25	27	25	24	21	#
Lower jaw to pelvic fin rudiment	45	54	48	47	42	#
Dorsal spine length	19	22	18	18	17	16
Interdorsal space	23	26	22	19	18	15
Longest dorsal ray	13	#	14	#	6.8	7.8
Longest anal ray	7.9	#	11	#	5.2	6.5
Longest pectoral ray	9	#	9.7	#	7.9	#
Length of caudal fin	28	31	29	23	21	20
Length of dorsal fin base	29	32	31	26	24	21
Length of anal fin base	28	35	31	26	23	21
Length of caudal peduncle	7.3	8.1	7.8	6.6	6.9	6.1
Depth of caudal peduncle	10	13	11	10	8.8	8.2
Length of pelvic fin rudiment	5.1	#	4.9	#	4.8	4
Soft dorsal fin ray count	26	25	26	26	27	26
Anal fin ray count	26	26	26	26	28	25
Pectoral fin ray count	11/7	11/11	11/11	10/10	11/11	11/11
Sex	Male	Male	Male	Female	Female	Male

Measurement not taken due to damage.

side of lower jaw; anterior pair of teeth in both jaws with pointed extremities; gill rakers on first gill arch 16 (from 73 mm SL paratype).

First dorsal spine originating over centre to slightly behind centre of eye; spine rather long, slightly shorter than interdorsal space, length 1.3 (1.2–1.3) in head length; spine robust, circular in cross-section, somewhat sinuous in shape, tapering to acute tip; spine of smallest available specimen (55 mm SL) with four rows of barbs, consisting of two adjacent rows of small barbs on anterior face (barbs mostly upward-directed, some with small downward-directed branch, prominent on proximal half but indistinguishable distally from spinules that cover anterior face of spine), and two rows of large downward-directed barbs on posterior face, projecting mostly posterolaterally; with increasing SL, anterior barbs become obsolete; second dorsal spine small, hidden in skin at rear base of first spine; interdorsal space without groove for receiving first dorsal spine when folded rearwards; soft dorsal fin elevated anteriorly in male, outer margin convex (Figure 2), longest dorsal ray 1.8 (1.7–3.1); anal fin not elevated anteriorly in either sex, outer margin convex, longest anal ray 3.0 (2.2–4.0); length of soft dorsal base 2.5 (2.4–2.6) in SL, equal to or slightly longer than anal fin base (bases of fin membranes not perforated); origin of soft dorsal fin directly above origin of anal fin; base of pectoral fin below a point ranging from slightly in advance of to slightly behind rear border of eye; caudal fin moderately long, length 0.9 (0.8–1.0) in head length, middle rays noticeably longer in male producing somewhat arrowhead appearance to posterior margin

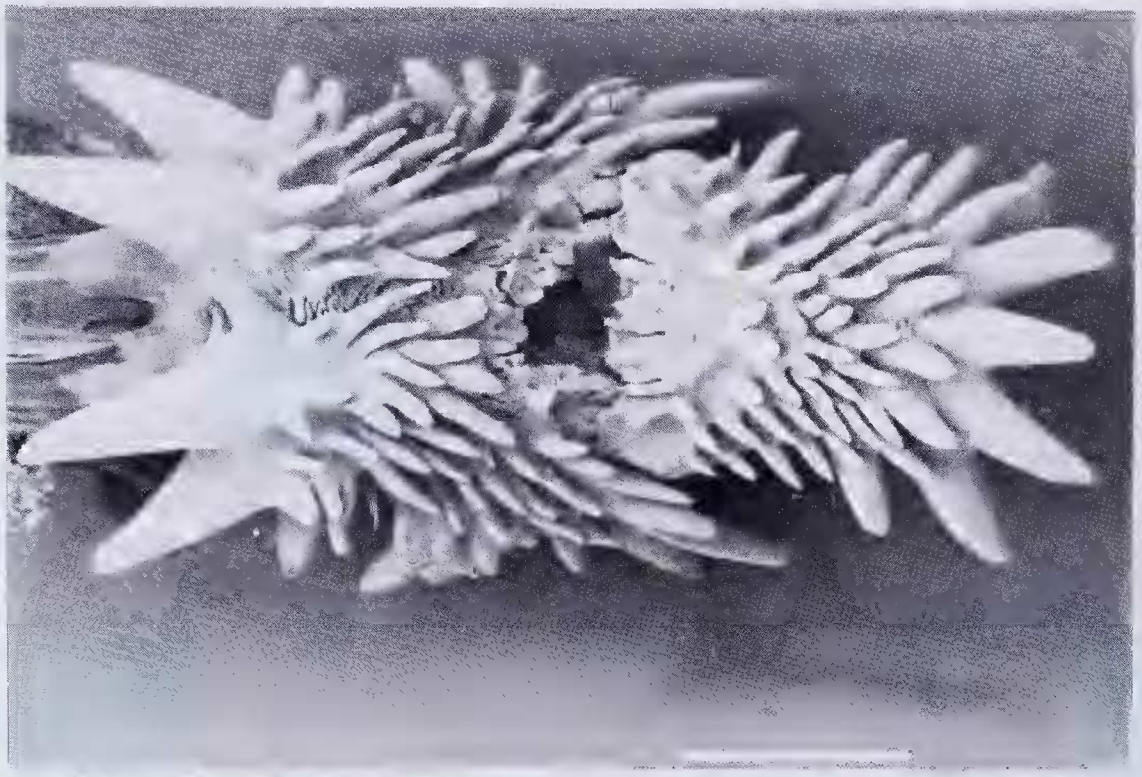

Figure 3 Pelvic fin rudiment (ventral view) of *Lalmohania velutina*, paratype, WAM P.30671-001, 55 mm SL (scanning electron micrograph: integumentary sheath removed to make encasing scales more visible; anterior end of rudiment facing left; white bar = 1 mm)

of fin; caudal peduncle length 3.3 (3.0–3.5) in head length, 1.4 (1.3–1.6) in caudal peduncle depth; pelvic fin rudiment (Figure 3) relatively large in size, length 1.4 (1.4–1.6) in eye diameter, consisting of five encasing scales with prominent barbs, an anterior pair (segment 1), a middle pair (segment 2), a single posterior scale (segment 3); scales of segment 2 separated from each other along ventral midline of rudiment by a prominent gap (Figure 3); segment 3 movably articulated with segment 2 and rear end of pelvis; pelvic fin rudiment not broadly joined to rear margin of ventral flap.

Anterior midbody scales small to moderate in size, mostly imbricate, elliptical in shape, with 1–5 slender, simple, posteriorly curved spinules supported by transverse ridge on each scale. spinules becoming longer posteriorly, reducing to one per scale (all scales on posterior three-quarters of body with only one spinule, except on base of soft dorsal and anal fins, see Figure 1); scale spinules on posterior portion of caudal peduncle of male moderately enlarged, robust, distal extremity curving anteriorly, spinules becoming smaller and more flexible anteriorly; scales on forehead with short, robust spinules, some rather flattened; spinules on breast scales similar but not flattened; skin velvety to slightly coarse; numerous moderately sized cutaneous tentacles on body, dorsal spine, and pelvic fin rudiment.

Colour of holotype in alcohol

Ground colour brown with many dark brown closely packed spots; head and body also with darker blotches, those on body tending to form two oblique, curved cross bands, first from anterior portion of second dorsal base to gill slit, second from midside of body above centre of anal fin base to ventral flap; indications of several dark bands across breast, two across interorbital space, two on bases of soft dorsal and anal fins; soft dorsal and anal fins hyaline, some body spotting extending onto basal portions; caudal fin pale brown to hyaline, with two wide curved dark cross bars, posterior bar subterminal; body spotting continuing onto membranes of caudal fin, but caudal spots slightly larger, more crowded, and more elliptical in shape; paratypes similar in colour to holotype, except dark spots on largest specimen forming short lines in region of pectoral fin.

Colour when fresh is not known, but based on colour transparencies of specimens taken after preservation in formalin for one month, ground colour is probably a pale greenish grey. Figure 2 is a black and white photograph of the holotype taken by J.E. Randall (BPBM) shortly after capture. Features now not visible in the preserved specimen include pale wavy lines on the snout, several whitish elongate blotches on the body, particularly one behind the gill opening, and several series of dark-edged white spots following the posterior margin of the caudal fin.

Etymology

This species is named *velutina* in reference to its velvet-like skin.

Distribution

Lalmohania velutina has so far been collected only from the Kilakkarai region of south-eastern India, where it apparently inhabits shallow weedy bottoms.

Remarks

Lalmohania velutina is a poorly known species, but is probably more widespread in southern India than is indicated by the available material. It may even occur in Sri Lanka. Munro

(1955) recorded *Stephanolepis diaspros* Fraser-Brunner, 1940 from Sri Lanka based on material trawled in the Gulf of Mannar (the type locality for *Lalmohania velutina* occurs on the Indian side of this gulf). However, it has not been reported from this region since, nor have any other members of the genus. Munro's brief account closely follows the type description of *S. diaspros*, which suggests that his specimens were not thoroughly examined. Perhaps they were in fact representatives of *L. velutina*, but at the time were not recognised as being undescribed.

ACKNOWLEDGEMENTS

I would like to thank Dr John E. Randall, Bishop Museum, Honolulu (BPBM) for sending specimens and photographs of this species. I participated in the FAO/DANIDA consultation through the invitation of Dr Walter Fischer (FAO, Rome), and was able to examine specimens at the Central Marine Fisheries Research Institute (CMFRI), Cochin, through the courtesy of its Director, Dr E.G. Silas. The scanning electron micrograph of the pelvic fin rudiment was made by Mr C.W. Bryce, Western Australian Museum (WAM).

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